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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/568,730

02/17/2006

Wolfgang Clemens

411000-147

7125

27162 7590 12/07/2007
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EXAMINER

SINCLAIR, DAVID M

ART UNIT

PAPER NUMBER

4125

MAIL DATE

DELIVERY MODE

12/07/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/568,730	Applicant(s) CLEMENS ET AL.	
	Examiner David M. Sinclair	Art Unit 4125	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>02/17/2006, 05/05/2006, & 05/18/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 10568730, filed on 02/17/2006.

Information Disclosure Statement

2. Documents in the information disclosure statements, attached hereto, that have been considered have been initialed and documents not considered have been crossed out. Copending applications submitted in the IDS filed on 05/05/2006 were not considered as a signature was absent however the copending applications were considered in a duplicate copy filed on 05/18/2006 that contained a signature.

3. U.S. Patent documents, US –2002/025391, US –2002/130042, and US –2003/059987, were all found to be missing a zero after the “/” however examiner considered the documents with the proper document numbers, US –2002/0025391, US –2002/0130042, and US –2003/0059987.

Drawings

4. The drawings are objected to under 37 CFR 1.83(a) because they fail to show 2' and 5' as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d).

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character “4” has been used to designate both semiconductor and insulator.

6. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character “3” has been used to designate both insulator and semiconductor.

7. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character “6” has been used to designate both semiconductor and insulator.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

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the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

8. The disclosure is objected to because of the following informalities: typos.

Page 10 – line 1 "semiconductor layer(s) 3, 5" examiner believes applicant meant "semiconductor layer(s) 3, 6"

Page 11 – line 1 “insulator layer 2” examiner believes applicant meant “insulator layer 4”

Page 13 – line 24 “layers such as may be required” should read, “layers may be required”

Appropriate correction is required.

Claim Objections

9. Claims 5 and 8 are objected to because of the following informalities:

grammatical errors

In regards to claim 5,

“wherein the at least one” should read “wherein at least one”.

In regards to claim 8,

“the at least one structured electrodes is” should read “the at least one structured electrode is”

Appropriate correction is required.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-4 and 6-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Sakai (4,529,994).

In regards to claim 1,

A first electrode (16 and 17 – see fig. 1; column 2 – line 11), a second electrode (18 – see fig. 1; column 2 – line 13), and an insulator layer (depletion layer, 19, – see fig. 1; column 2 – line 17; a depletion layer is an insulating region in a

semiconductor junction) disposed between the first and second electrodes (see fig. 1), wherein at least one first semiconductor layer (14 & 15 – see fig. 1; column 2 – lines 7-8) is located between the first and second electrodes (see fig. 1). The limitations “wherein the concentration of free charge carriers in at least said first semiconductor layer is varied in a controlled manner by application of a voltage between said first and second electrodes, the concentration of said charge carriers determining the capacitance of the capacitor, and the concentration of said free charge carriers in at least said first semiconductor layer is additionally varied in a controlled manner by a frequency of the applied voltage” are inherently met as these limitations are properties of the above structure.

In regards to claim 2,

The limitation “the variation of the concentration of said free charge carriers results in a variation of an effective spacing (a) of the electrodes serving as capacitor plates, and said effective spacing (a) functionally determines the capacitance” is a property of the above structure of claim 1 and is therefore inherently taught.

In regards to claim 3,

The limitation “the variation of the concentration of said free charge carriers results in a variation of an effective plate surface area, and said effective plate

surface area functionally determines the capacitance” is a property of the above structure of claim 1 and is therefore inherently taught.

In regards to claim 4,

An organic capacitor as defined in claim 1 wherein at least one of said first and second electrodes is a structured electrode. First electrode (16 & 17) is structured (see fig. 1).

In regards to claim 6,

An organic capacitor as defined in claim 1 wherein said organic capacitor comprises a second semiconductor layer (11 – see fig. 1; column 1 – lines 67-68) located between said first and second electrodes and disposed on one of the sides of said insulator layer opposite said first semiconductor layer (see fig. 1). The limitation “the concentration of said free charge carriers in said second semiconductor layer being varied in a controlled manner by applying a voltage between said first and second electrodes” is inherently met as this limitation is a property of the above structure.

In regards to claim 7,

An organic capacitor as defined in claim 6, wherein said first and second semiconducting layers are of opposed conductance types. First semiconductor

layer, 14 and 15, is p-type (column 2 – lines 7-8) and second semiconductor layer is n-type (column 1 – lines 67-68).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. Claims 5, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakai '994 in view of Duthaler et al. (2002/0053320).

In regards to claim 5,

The reference as applied to claim 1 teaches all the limitations except at least one of said first structured electrodes is embedded in said semiconducting layer.

Duthaler '320 teaches structured electrode, 40 & 42, being embedded in a semiconductor layer, 38 (see fig. 1b).

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It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the above references to obtain a more durable capacitor with an electrode that is less susceptible to damage.

In regards to claim 8,

The reference as applied to claim 6 teaches all the limitations except at least one of the said first and second electrodes is a structured electrode and the at least one structured electrode is embedded in at least one of said first or second semiconductor layers.

Sakai '994 teaches a first electrode (16 & 17) being structured (see fig. 1).

Duthaler '320 teaches structured electrode, 40 & 42, being embedded in a semiconductor layer, 38 (see fig. 1b).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the above references for the reason stated above.

In regards to claim 9,

The reference as applied to claim 1 teaches all the limitations except at least one of said functional layers is a layer of an organic substance.

Duthaler '320 teaches the semiconductor layer, 38, being organic ([0040]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the references to obtain semiconductor layers that are easy to fabricate, mechanically flexible, and low cost.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Fukayama et al. (6,239,662) teaches a variable capacitor with two semiconductors of opposite conductance type separated by an insulator layer. Fukayama further teaches an electrode.

Mitani et al. (6,787,433) teaches a glass substrate, a p-type semiconductor being separated from an n-type semiconductor by an insulator. Mitani further teaches a plurality of electrodes (see fig. 11).

Doucette et al. (2,989,650) teaches a variable capacitor with two semiconductors of opposite conductance type separated by an insulator layer and two electrodes.

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David M. Sinclair whose telephone number is (571) 270-5068. The examiner can normally be reached on Mon - Fri 7:30-5, alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, CHARLES D. GARBER can be reached on (571) 272-2194. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. M. S./

/Charles D. Garber/
Supervisory Patent Examiner, Art Unit 4125